US Army Corps
of Engineers
Fort Worth District

Mitigation and the Section 404 Regulatory Program

Draft - May 28, 2002

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged and fill material into waters of the United States, including wetlands. As a result, Department of the Army authorization is normally required to conduct such ground disturbing activities as filling, grading, mechanized land clearing, and excavation that results in more than incidental fallback of dredged material if they occur in waters of the United States. When the USACE reviews a project that would require Department of the Army authorization, its evaluation typically includes a determination of whether the applicant has taken sufficient measures to mitigate the project's likely adverse impact on the aquatic ecosystem. Mitigation is a three-step sequential process with the steps taken in the following order:

Avoid: Take all appropriate and practicable measures to avoid those adverse impacts to the aquatic ecosystem that are not necessary.

Minimize: Take all appropriate and practicable measures to minimize those adverse impacts to the aquatic ecosystem that cannot reasonably be avoided.

Compensate: Implement appropriate and practicable measures to compensate for adverse project impacts to the aquatic ecosystem that cannot reasonably be avoided or further minimized. This step is also referred to as compensatory mitigation.

While this sequential mitigation process is normally applied only during the individual permit process, most nationwide and regional general permits require that discharges of dredged or fill material into waters of the United States be avoided and minimized to the maximum extent practicable, unless the District Engineer approves a compensatory mitigation plan that is more beneficial to the environment than minimization or avoidance measures that could be undertaken at the project site. The District Engineer will normally require the implementation of all appropriate and practicable compensation as a condition of the Department of the Army authorization.

The purpose of compensatory mitigation is to replace those aquatic ecosystem functions that would be lost or impaired as a result of a USACE-authorized activity. The type and amount of compensatory mitigation required will be commensurate with the nature and extent of the activity's adverse impact on aquatic functions and practicable in terms of cost, existing technology, and logistics, in light of the overall project purpose. Aquatic functions, which are most simply defined as "the things that aquatic systems do," include sediment trapping and nutrient removal; erosion control; provision of habitat for fish and wildlife, including endangered species; flood storage and conveyance; groundwater recharge; water supply; production of food, fiber, and timber; and recreation. The number and extent of aquatic functions performed by the myriad aquatic sites found across the Fort Worth District varies considerably.

Compensatory mitigation may include the restoration, enhancement, creation, or, in exceptional cases, preservation of wetlands and other aquatic resources. **Restoration** is the manipulation of the physical, chemical, or biological characteristics of a former or substantially degraded wetland, or other aquatic resource to return natural and/or historic functions; **enhancement** is the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific function or functions or to change the growth stage of composition of the vegetation present, and may

include converting the site to a less destructive land use; **creation** is the establishment of a wetland or other aquatic resource where one did not formerly exist; and **preservation** is the legal and physical protection of existing ecologically important wetlands and other aquatic resources for an extended period of time, usually in perpetuity. Preservation is normally appropriate only in exceptional cases, such as when a high-value aquatic resource would likely be destroyed or substantially degraded by lawful activities were it not protected by preservation. Restoration and enhancement are generally preferred to creation because these actions are normally less expensive to implement, less prone to failure, and less likely to adversely affect existing valuable upland habitats. Compensatory mitigation that would involve ground disturbing activities in waters of the United States may itself require Department of the Army authorization.

Mitigation should be planned and designed to be self-sustaining to the maximum extent practicable. Mitigation projects that involve complex hydraulic engineering features and/or questionable water sources, e.g. pumped from another location, are most costly to develop, operate, and maintain, and have a higher risk of failure than mitigation projects designed to function after initial establishment with little or no human intervention.

It is important to remember that the primary goal of compensatory mitigation is to replace those aquatic functions that would be lost or impaired as a result of the proposed activity. That is, compensation should generally be "in-kind." Compensatory mitigation should also replace aquatic functions as close to the site of the adverse impact as practicable on order to minimize losses to the local aquatic system. However, out-of-kind and/or off-site compensation may be appropriate when compensation either cannot reasonably be conducted in kind and/or at the impact site or would be more beneficial to the aquatic ecosystem if conducted out-of-kind or at another location. In some cases, it may be acceptable to provide partial compensation at multiple locations. For example, compensation for lost flood storage and sediment trapping functions might be required on-site while compensation for lost wildlife habitat might be allowed at another location.

Compensatory mitigation is normally implemented by taking one of two general approaches: project-specific mitigation or third-party mitigation. Project-specific mitigation is conducted to compensate for the adverse impacts of a single activity requiring Department of the Army authorization. It is typically designed and implemented by the permittee in conjunction with the authorized activity and conducted on-site. The permittee is responsible for monitoring and assuring the success of the project-specific mitigation.

Third-party mitigation typically consolidates the compensatory mitigation for several projects requiring Department of the Army authorization into one or more off-site mitigation projects. This approach is distinguished from project-specific mitigation in that a third party typically accepts the responsibility of designing, implementing, and assuring the success of compensatory mitigation for the permittees. This approach includes mitigation banking, combined or joint mitigation projects, and in-lieu fee and fee-based mitigation. A brief description of each follows:

> **Mitigation banking**: Mitigation systems that provide consolidated off-site compensation for the adverse impacts of numerous authorized activities in advance of those impacts. A mitigation bank is developed and operated pursuant to the provisions of a mitigation banking instrument that are mutually agreed to by the bank owner, the USACE, and other natural resource agencies. In most cases, Department of the Army authorization is also required to develop the bank. For further information on mitigation banking, refer to "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks," published in the Federal Register on November 28, 1995 (Vol. 60, No. 228, pp. 58605-58614).

Combined or joint-project mitigation: Mitigation systems that simultaneously provide compensatory mitigation for multiple USACE-authorized activities that adversely impact the aquatic ecosystem. Unlike a mitigation bank, joint-project mitigation typically does not provide compensation in advance of project impacts. Each use of a joint mitigation project typically requires specific USACE approval.

In-lieu fee and fee-based mitigation: Mitigation systems that provide a Department of the Army permittee an opportunity to pay a fee in lieu of conducting project-specific mitigation. Fees are then used to fund projects that are designed to restore, enhance, create, or, in some cases, preserve aquatic ecosystem functions. These projects should reflect both the nature and extent of the aquatic functions that are adversely affected by USACE-authorized activities. With an in-lieu fee system, specific mitigation projects that would be funded by in-lieu fees may not yet have been identified at the time the in-lieu fees are paid. With fee-based systems, specific mitigation projects have been identified and are either complete or under development at the time the fees are paid. For further information on in-lieu fee mitigation, refer to "Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act" dated October 31, 2000, and published in the Federal Register on November 7, 2000 (Vol. 65, No. 216) and "Compensatory Mitigation by In-Lieu Fee in the Fort Worth District" dated March 25, 1999.

Department of the Army permit applicants are responsible for developing an appropriate and practicable mitigation plan and submitting it to the USACE. A mitigation plan specifies the measures that the applicant would take to minimize the project's adverse impact on the aquatic environment and to replace the aquatic functions that would be lost or impaired as a result of the authorized activity. An appropriate protective real estate arrangement, such as a deed restriction, is normally a required component of a mitigation plan. Successful implementation of all elements of the mitigation plan is a requirement of the Department of the Army permit.

Mitigation plan proposals are evaluated by Fort Worth District Regulatory Program staff as part of the permit application evaluation process, often in consultation with other natural resource agencies including the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Texas Natural Resource Conservation Commission, Railroad Commission of Texas and Texas Parks and Wildlife Department. Mitigation plan proposals should thoroughly describe how the applicant would minimize and compensate for the project's likely adverse impact on the aquatic environment and normally include the following components (in the order presented):

Title Page. The title page should include the project name, applicant's name, mitigation plan preparer's name (if different from applicant), date of the plan or plan revision, and USACE project number.

Introduction. The introduction should include a concise description of the proposed project, a summary of the likely adverse and beneficial impacts on the aquatic environment, and an outline of the measures that would be taken to minimize and compensate for those impacts.

Mitigation Plan. This section should generally include the following components:

1. a complete description of the measures the applicant proposes to take to avoid and minimize the adverse impact of the project on the aquatic environment, both on-site and off-site. Include a summary of the alternatives that were considered in addition to the preferred and no-action alternatives, a discussion of their practicability, a clear rationale for the selection or rejection of each alternative, and a discussion of the

measures proposed to be taken to avoid adverse impacts of the preferred alternative on the aquatic environment.

2. a description of the direct and indirect permanent and temporary adverse impacts the proposed project would have on the aquatic environment after avoidance and minimization measures have been taken. This description should accurately detail the specific physical impacts that the project would have on waters of the United States and adjacent buffer areas and assess the nature and extent of loss in aquatic function that would likely occur as a result of the proposed activities. For projects that would affect multiple waters of the United States, include a table summarizing the project impacts by waterbody.

3. a statement of the goals and objectives of the mitigation plan. The goals should clearly define the intended result of the proposed compensatory mitigation in terms of hydrologic conditions, vegetational community, and aquatic ecosystem functions. The objectives should be a list of specific, measurable outcomes of the compensatory mitigation that can be used to demonstrate whether or not the goals of the mitigation plan have been achieved.

4. a thorough description of the proposed mitigation area, including a vicinity map, site map, aerial (if available) and on-site photographs, and descriptions of the land use history, local hydrology, soils, and dominant vegetation. The location and direction of each submitted photograph should always be indicated on a site map.

5. a preliminary jurisdictional determination of the proposed mitigation area that includes a wetland delineation, if appropriate, conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual. The preliminary jurisdictional determination should include a detailed site description, field data sheets, summary of findings, photographs, and a detailed map showing the location and extent of all areas identified as waters of the United States, including wetlands. The map must include a clear delineation of the mitigation area boundary, clearly marked waters of the United States, a north arrow, bar scale, and legend. Legends should include the project name, USACE project number, and date. Areas marked as waters of the United States on this map should be more specifically identified as stream, pond/lake, forested wetland, and emergent (or non-forested) wetland.

6. a detailed description of the proposed compensatory mitigation activities, including the location, extent, and nature of all ground-disturbing activities and structures. Include information about land clearing, grading, site preparation, planting, road and trail construction, size and spacing of culverts and bridges, fences, buildings, utility lines, intake and outfall structures, and location of disposal and borrow areas. Provide plan and cross-section drawings of all pertinent work and structures and the volume and type of material that would be discharged, either temporarily or permanently, into waters of the United States. All drawings and maps should contain a title, date, USACE project number, legend, bar scale, and north arrow, as appropriate. In general, all drawings and maps should be submitted on 8 2 -inch x 11-inch sheets. Include a table showing the extent of waters of the United States (acres and/or linear feet, as appropriate) that would be restored, enhanced, preserved, or created. Describe how the proposed activities are expected to benefit the aquatic environment. (As-built drawings may be required after construction is complete, especially in the case of created aquatic resources.)

7. identify all existing liens and encumbrances on the mitigation area and state how they would affect the mitigation project.

8. a description of the actions that would be taken to protect wetlands, streams, and other aquatic areas, including their buffer zones, adjacent to the construction area. Protective actions should include confining construction materials and debris to the construction site, protecting water quality, maintaining normal hydrology, preventing the movement of soil, and protecting vegetation from damage.

9. recognizing the crucial role that hydrology often plays in determining the success or failure of a mitigation project, as appropriate, the following hydrologic information:

a. a description of the expected future hydrology of the mitigation area and demonstration that it would be sufficient to accomplish the goals of the mitigation plan. Hydrologic and/or hydraulic modeling may be required to show that the future frequency, duration, timing, volume, and velocity of flows, as well as the depth of saturation or inundation, would be appropriate for the mitigation plan. Both surface and groundwater components of hydrology should be described and

b. demonstration that the proposed grading would allow water to flow within the mitigation area as expected and without adversely affecting the functioning of the mitigation project, such as by causing erosion. Include a detailed description of all water control structure that would be used and their invert elevations.

10. a description of the substrate of the mitigation area and the source and type of any supplemental soil that would be used, demonstrating that it would support the proposed plantings and hydrology. Detailed soil profiles, chemical and physical analyses, and description of redoximorphic features may be required.

11. a planting plan that includes a complete list of the species, by common and scientific name, that would be planted in each area to be planted, quantity and size of each species to be planted, planting density, planting method, planting schedule, and plans and drawings that specify the areas to be planted and the approximate number of each species that would be installed in each area. Normally, only native, locally adapted species appropriate for the site will be accepted. Generally, no less than 300 bare root tree seedlings and no less than 400 shrubs per acre should be planted. In cases where species diversity is important (most cases), at least four species should be planted and no species should represent more than 30 % of the plantings. The planting plan must include provisions for establishing temporary vegetation (either non-persistent or native species) on exposed soils to prevent soil erosion. Other methods of establishing a temporary vegetative cover, such as mulching and erosion control blankets, may be used individually, or in combination, as appropriate. The planting plan should also describe any proposed temporary vegetation management activities, such as irrigation or periodic control of competing vegetation.

12. planting success criteria. The following criteria are generally appropriate:

a. herbaceous plantings.

(1) exhibit an 80% ground cover three years after planting (or replant until an 80% ground is achieved three years after the most recent remedial planting) and

(2) none of the three most dominant species may be non-native, noxious, or invasive species.

b. tree and shrub plantings.

(1) Method 1:

(a) a minimum five-year survival rate (or replant as needed to achieve at least that survival five years following the most recent remedial planting);

(b) the three most dominant species of trees and shrubs (three of each) must be species typically dominant in a natural situation; and

(c) no one species may constitute more than 30% of the surviving planting.

(2) Method 2:

(a) Guarantee a minimum density of trees five years after planting. Eligible trees must belong to a species on a list of approved native, high-quality, locally adapted species included in the mitigation plan and must be at least 1 inch diameter at breast height or 6 feet tall. Eligible shrubs must belong to a species included on a list of approved shrub species and stand at least 2 feet tall. If the density is less than the minimum five years after planting, the permittee would replant as necessary to achieve the minimum density five years after the remedial planting. Volunteer growth that meets the species and size criteria is eligible for counting;

(b) the three most dominant species of trees and shrubs (three of each) must be species typically dominant in a natural situation; and

(c) no one species may constitute more than 30% of the surviving planting.

Variations may be appropriate according to local conditions, if justified. Plantings should be closely monitored and apparent deficiencies rectified as soon as possible. Rectification may involve replanting, controlling competing vegetation, guarding against herbivory, installing temporary water control structures, or irrigating.

13. a set of performance standards that specify the minimum level of success a mitigation plan is required to meet. Typically, the permittee is responsible for maintaining the mitigation area until can demonstrate to the satisfaction of the USACE that those components of the mitigation area intended to become:

a. waters of the United States meet the definition of a waters of the United States under the Regulatory Program regulations applicable at the time the project is authorized;

b. both wetland and waters of the United States meet the definition of a wetland under the Regulatory Program regulations applicable at the time the project is authorized;

c. waters of the United States are functioning as the intended type of waters of the United States and at the level of ecological performance prescribed in the mitigation plan; and

d. buffer and riparian zones and other areas integral to the enhancement of the aquatic ecosystem are functioning as the intended type of ecosystem component and at the level of ecological performance prescribed in the mitigation plan.

14. a discussion of how the expected ecological benefits of the mitigation plan would balance the likely adverse environmental impact of proposed project.

15. an assessment documenting whether any species listed as threatened or endangered under the Endangered Species Act might be affected by, or found in the vicinity of, the proposed mitigation project.

16. any additional relevant information such as descriptions of how mitigation plan activities might affect cultural resources, ecologically sensitive areas, or local/regional hydrology.

17. a long-term operation and management plan that supports the goals and objectives of the mitigation plan. Generally, the operation and management plan should include provisions for maintaining fences, roads, water control and conveyance structures, and other pertinent facilities in an acceptable condition for the life of the mitigation project. Maintenance activities should also include, as appropriate, trash removal, maintenance of sediment-trapping facilities, and removal of tree stakes and sediment control devices when no longer needed.

The long-term operation and management plan should also include a vegetation management plan that calls for avoiding disturbances to vegetation in the mitigation area to the maximum extent practicable, letting nature take its course in the development of the intended vegetative communities. However, as necessary to protect components of the intended vegetative community and achieve the goals and objectives of the mitigation plan, the vegetation management component of the plan may include provisions to control non-native, invasive, or noxious vegetation. Minimal-impact techniques, which could involve hand-clearing, chemical treatment, burning, shredding, and disking, should be used whenever practicable. Methods that would adversely affect the ability of the mitigation project to achieve its goals will generally not be approved. Any vegetative control technique not included in the USACE-approved mitigation plan will generally require USACE approval prior to its use.

18. a plan for monitoring the progress of the mitigation project towards achieving the goals stated in the plan. Monitoring typically involves periodically measuring the development of hydrology, vegetation, soils, and habitat for aquatic and terrestrial wildlife. Monitoring should employ standard sampling methods; standard statistical methods should demonstrate that the results of the monitoring are valid and accurately describe the conditions in the mitigation area. Monitoring may also include conducting wetland delineations, collecting hydrologic data, and developing a photographic record of the progress of the project. Photographs periodically taken at permanent stations are an important tool for documenting the progress of the mitigation project. Typical monitoring techniques include:

a. mapping the vegetative communities of the mitigation area, conducting plant inventory, noting any problem species, establishing and using transects or permanent sampling stations, measuring species and spatial diversity, measuring relative cover for the total vegetative stratum and for each dominant species in the stratum, determining the total number of species (similar to 1987 manual), importance value of dominant species. Snags, coarse woody debris and other features should be described. Consider using a standard habitat assessment method, such as Texas Parks and Wildlife's "Wildlife Habitat Assessment Procedure" or "An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices," (Smith, R. D., Ammann, A., Bartoldus, C., and Brinson, M. M., 1995, Technical Report WRP-DE-9, U. S. Army Engineer Waterways Experiment Station, Vicksburg, MS.);

b. monitor changes in the soil profile (color, texture, redoximorphic features, etc.). Monitor the development of hydric soil characteristics where applicable. Representative pits for each community. Subsequent assessments should be near pit but not in pit; and

c. hydrology: note changes in hydrology, and results of monitoring frequency, duration, depth, of inundation or saturation.

19. a plan for implementing a reporting program to provide information to the USACE and other appropriate entities on monitoring results, mitigation success, and general compliance.with the terms and conditions of the permit. Written compliance reports would typically include the following:

a. designation of the party responsible for coordinating with the Regulatory Branch, Fort Worth District, USACE concerning written compliance reports, on-site inspections, and compliance with permit conditions;

b. notification to the USACE of the schedule of activities for each phase of the project at least 30 days prior to the start of soil-disturbing activities;

c. notification to the USACE of the date of the pre-construction meeting held by the permittee for appropriate contractor(s) to explain the terms and conditions of the permit, provisions of the mitigation plan, and the contractor's responsibility in ensuring compliance with the permit. The permittee will confirm to the USACE that the meeting was held within two weeks following the meeting;

d. submission of annual written compliance reports to the USACE, generally due on October 1 each year. Compliance reports are required even if no work is conducted during the reporting period. Compliance reports are submitted to the USACE until the USACE verifies that the permittee has successfully completed all mitigation plan components, the mitigation areas have met the performance standards, including planting success requirements included in the plan, and all authorized construction activities have either been completed or deleted from the project. Each compliance report will normally include, at a minimum, the following information:

(1) describe any changes in the construction or mitigation plan implementation schedule;

(2) summarize the activities that occurred during the reporting period, including demonstration of the permittee's compliance with the permit conditions, and documentation of the progress and/or completion of all authorized work, including mitigation plan activities in meeting performance standards and planting success;

(3) describe pre-construction (baseline) conditions of the project area, including mitigation area, in the initial compliance report;

(4) demonstrate that the permittee is in compliance with all permit conditions;

(5) document the progress and/or completion of all authorized work, including mitigation plan activities;

(6) describe the project's actual impact to waters of the United States;

(7) show that disturbed areas, such as borrow ditches, road embankments, stream banks, road crossings, and temporary impact areas are revegetating adequately and not suffering erosion damage;

(8) demonstrate that adjacent aquatic areas are adequately protected from construction activities; and

(9) photographs, maps, and drawings to support the written components of the mitigation plan.

20. the name, qualifications, and contact information of the qualified mitigation specialist (biologist, ecologist, or other specialist qualified in aquatic ecosystem restoration, enhancement, and/or creation) retained to oversee project construction and mitigation plan implementation, including planting, monitoring, and reporting provisions.

21. a schedule for implementing and completing each element of the mitigation plan.

22. provision for a protective covenant, such as a deed restriction. The deed restriction is intended to ensure that the existence of the mitigation area and provisions of the mitigation plan will be known to any entity that may be involved in a future real estate action concerning the mitigation area will be informed of the existence of the mitigation plan and the restrictions included in that plan. Other protective mechanisms, such as a conservation easement, may also be acceptable. An appropriate deed restriction will normally be perpetual and include the following provisions:

a. the subject area is protected in perpetuity under the provisions of the mitigation plan as the type of aquatic resource specified in the plan (e.g., wetland, stream and buffer zone, etc.);

b. the area shall not be disturbed, except by those activities that would not adversely affect the intended extent, condition, and function of the mitigation area or those activities specifically provided for in the USACE-approved mitigation plan or in the special conditions of the Department of Army authorization;

c. the area to be restricted shall be surveyed;

d. the restriction shall not be modified or removed from the deed without the written approval of the U.S. Army Corps of Engineers; and

e. conveyance of any interest in the property shall be subject to the deed restriction.

For example, a deed restriction provision might read: "The permittee will dedicate in perpetuity, as a stream and stream buffer zone preserve, the approximately 12.9-acre mitigation area identified in the mitigation plan, 'Mitigation Plan for the Shady Acres Residential Development, Tarrant County, Texas,' dated February 28, 1999. The only exceptions to the deed restriction shall be easements in existence on January 1, 1999. The mitigation area will not be disturbed, except by those activities that would not adversely affect the intended extent, condition, and function of the mitigation area or by those activities specifically provided for in the approved mitigation plan or in the special conditions for this permit. Unless otherwise specified, livestock grazing, mowing, and similar activities will not be allowed in the mitigation area. The permittee will survey the mitigation area, develop an appropriate deed restriction for the surveyed area, submit the draft deed restriction to the USACE for review and approval, and then record the USACE-approved deed restriction with the Tarrant County Clerk. The permittee will provide a copy of the recorded deed restriction to the USACE by October 1, 1999. The restriction will not be modified or removed from the deed without the written approval of the USACE. The conveyance of any interest in the property shall be subject to this deed restriction." Sample deed restriction formats may be obtained upon request from the Fort Worth District office.

For further information about preparing compensatory mitigation plans or the USACE regulatory program, contact the Regulatory Branch at: U.S. Army Corps of Engineers; Regulatory Branch, CESWF-PER-R; P.O. Box 17300; Fort Worth, Texas 76102-0300. You may visit the Regulatory Branch in Room 3A37 of the Fritz Lanham Federal Building at 819 Taylor Street in Fort Worth between 8:00 A.M. and 3:30 P.M., Monday through Friday. Telephone inquiries should be directed to (817)886-1731. On the Internet, visit the Fort Worth District's Regulatory Branch homepage at *http://www.swf.usace.army.mil/regulatory/* and the national Regulatory Program homepage at h*ttp://www.usace.army.mil/inet/functions/cw/cecwo/reg/*.